

REMARKS

In view of the above amendments and the following remarks, reconsideration of the rejections contained in the final Office Action of November 20, 2006 and the Examiner's assertions in the Advisory Action of April 2, 2007, is respectfully requested.

In the Amendment previously filed March 20, 2007, the Applicants attempted to amend the portion of the specification appearing on page 25, lines 7-12 of the original English translation of the specification (corresponding to page 24, lines 18-23 of the substitute specification filed October 6, 2006) in order to correct the names of the compounds identified therein. Specifically, the Applicants' undersigned representative stated that these changes were made to include the "alternate common name" of the compounds set forth in the original English translation of the specification, and that statement was based on the undersigned's understanding at the time (i.e., there was no intention to deceive the Examiner). In view of further research on this issue in view of the Examiner's comments in the Advisory Action of April 2, 2007, however, it has now become apparent that the incorrectly-worded compounds set forth in the original English translation of the specification were the result of simple translational errors, as explained below.

This application was initially filed with Japanese language specification on March 19, 2004. Subsequently, an English translation of the original Japanese language specification was submitted (with the required verified statement) on September 3, 2004. However, after carefully reviewing the original Japanese language specification and the original English translation of the specification as explained in the Declaration under 37 CFR 1.132 submitted herewith, it has become clear that the original English translation contained an error in the translation of the compounds on page 25, lines 7-12 of the original English translation. Specifically, rather than palladium *hydrochloric acid*, palladium *sulfuric acid*, and palladium *acetic acid*, the compounds listed in that section of the English translation should read palladium *chloride*, palladium *sulfate*, and palladium *acetate*, respectively. In addition to the statements explaining this translational error as set forth in the Declaration executed by Xinming Wang and submitted herewith, further evidence of this obvious translational error can be found on page 38, lines 1-3 of the original

English translation. Specifically, the compound formulas found in this portion of the specification are consistent with the corrected compounds discussed above.

In order to effect the necessary corrections to the English translation of the specification as noted above, paragraph [0093] on page 24 of the substitute specification filed October 6, 2006 has now been amended as indicated above. In particular, the incorrectly-translated compounds have now been corrected as explained above and in the attached Declaration. Because these corrected compounds were contained in the original disclosure (i.e., in the original Japanese-language specification), and the amendments to the English-language specification merely constitute editorial corrections, it is submitted that no new matter has been added. Consequently, the Examiner is respectfully requested to enter the amendments to the specification. Furthermore, the Examiner is requested to note that amended independent claim 1 has now been corrected so as to correspond to the correct compounds discussed above.

In the Advisory Action of April 2, 2007, the Examiner also asserted that the limitation “the pretreatment liquid is an aqueous liquid free of any oxidizing agent” raises the issue of new matter because there does not appear to be support in the original disclosure for this limitation. However, the Examiner’s attention is again directed to the attached Declaration executed by Inventor Xinming Wang. In the Declaration, Dr. Wang has quoted four different sections of the specification which discuss and describe the pretreatment liquid. Later in the Declaration, Dr. Wang concludes that in view of the *explicit* teachings in the four quoted sections of the specification, in combination with Dr. Wang’s extensive education and experience in the area of pretreatment liquids used during substrate processing methods, it is his firm belief and understanding that the disclosure of the above-referenced US patent application at least *inherently* teaches that the pretreatment liquid is an aqueous liquid which is free of any oxidizing agent. In other words, it is Dr. Wang’s position that one of ordinary skill in the art (such as Dr. Wang) would clearly understand from the original disclosure that the pretreatment liquid of the present invention is an aqueous liquid which is free of any oxidizing agent. As a result, it is submitted that the amendments to independent claim 1 indicated above do not constitute new matter, and the Examiner is therefore requested to enter and consider these amendments.

Finally with respect to the Advisory Action, the Examiner asserted that the amendments presented in the previous response filed March 20, 2007 raised new issues requiring further search and consideration. Therefore, in view of the finality of the outstanding Office Action issued November 20, 2006, the Examiner did not enter those amendments. However, the Applicants have now prepared and submitted herewith a Request for Continued Examination, requesting that this amendment be entered and considered by the Examiner. Consequently, the Examiner is requested to enter and consider the claim amendments indicated above and discussed in more detail below.

In item 6 on page 3 of the final Office Action of May 20, 2007, the Examiner rejected dependent claims 31 and 32 under 35 USC § 112, second paragraph, as being indefinite. In particular, the Examiner asserted that the compounds recited in these claims were confusing as worded. In this regard, the Examiner is requested to note that the subject matter of previously-pending dependent claim 31 has now been incorporated into independent claim 1. Furthermore, the original language of dependent claim 31 has been modified so as to recite the corrected name of the compounds previously recited in claim 31, and claim 32 has been amended in a similar manner. Furthermore, as explained above, corresponding changes have also been made to the specification. As the meaning and scope of the new language recited in the amended claims is entirely clear, it is respectfully submitted that the Examiner's formal rejections under section 112 have been overcome.

The Examiner has rejected independent claim 1 and dependent claims 6-9, 11-13, 17, 19, and 31-34 as being unpatentable over the Ferrier reference (USP 5,843,517) in view of the Chen reference (USP 6,699,380); has rejected claim 10 as being unpatentable over the Ferrier reference in view of the Chen reference, and further in view of the Stevens reference (USP 6,824,612); has rejected claims 14-16 as being unpatentable over the Ferrier reference in view of the Chen reference, and further in view of the Yoshio reference (USP 6,555,158); and has rejected claim 18 as being unpatentable over the Ferrier reference in view of the Chen reference, and further in view of the Arcilesi reference (USP 4,814,205). However, as noted above, independent claim 1 has been amended so as to incorporate the subject matter of previously-pending dependent claim

31. Therefore, for the reasons discussed below, it is respectfully submitted that amended independent claim 1 and the claims that depend therefrom are clearly patentable over the prior art of record.

Independent claim 1 has now been amended to recite that the substrate processing method comprises bringing a pretreatment liquid into contact with a surface of a substrate, and the *pretreatment liquid is an aqueous liquid free of any oxidizing agent*. The aqueous liquid is formed of a mixture including at least one of a group consisting of palladium chloride, palladium sulfate, and palladium acetate, and at least one of a group consisting of hydrochloric acid, sulfuric acid, fluoric acid, acetic acid, oxalic acid, formic acid, citric acid, and tartaric acid (see page 24, line 24 through page 25, line 12 of the original specification). As a result of the composition of the pretreatment liquid as recited in amended independent claim 1, a metal oxide film can be removed from the surface of a metal region of the substrate without removing the metal itself in the metal region because the aqueous liquid is free of any oxidizing agent and, therefore, the exposed surface of the metal region is not oxidized by an oxidizing agent. Consequently, the reliability of the device can be improved without degrading the electrical performance of the device interconnects.

The Ferrier reference discloses a composition and a method for selectively plating a circuit board. The Examiner asserted that the Ferrier reference teaches performing a preplating treatment on the surface of a substrate, in which a pretreatment liquid is brought into contact with the surface of the substrate. However, the Ferrier reference clearly teaches that the pretreatment liquid is formed of a composition that comprises precious metal ions and an *oxidizing agent* in an acidic aqueous solution (see column 3, lines 20-21 and 50-65 of the Ferrier reference). Thus, the Ferrier reference clearly does not disclose or suggest a pretreatment liquid which is an aqueous solution free of any oxidizing agent. In fact, the Ferrier reference clearly *teaches away* from such an aqueous liquid by clearly explaining that the composition includes an oxidizing agent.

The Chen reference, the Stevens reference, the Yoshio reference, and the Arcilesi reference also do not, either alone or in combination, disclose or suggest a pretreatment liquid which is an aqueous liquid free of any oxidizing agent, and which is formed of a mixture

including at least one of a group consisting of palladium chloride, palladium sulfate, and palladium acetate, and at least one of a group consisting of hydrochloric acid, sulfuric acid, fluoric acid, acetic acid, oxalic acid, formic acid, citric acid, and tartaric acid. Therefore, one of ordinary skill in the art would not be motivated by any of these references to modify the Ferrier reference so as to obtain the invention recited in amended independent claim 1. Accordingly, it is respectfully submitted that amended independent claim 1 and the claims that depend therefrom are clearly patentable over the prior art of record.

In view of the above amendments and remarks, it is submitted that the present application is now in condition for allowance. However, if the Examiner should have any comments or suggestions to help speed the prosecution of this application, the Examiner is requested to contact the Applicant's undersigned representative.

Respectfully submitted,

Xinming WANG et al.

By: 

W. Douglas Hahm
Registration No. 44,142
Attorney for Applicants

WDH/akl
Washington, D.C. 20006-1021
Telephone (202) 721-8200
Facsimile (202) 721-8250
May 21, 2007



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of : Confirmation No. 7167
Xinming WANG et al. : Attorney Docket No. 2004_0441A
Serial No. 10/803,949 : Group Art Unit 1762
Filed March 19, 2004 : Examiner Howard E. Abramowitz

SUBSTRATE PROCESSING
METHOD AND SUBSTRATE
PROCESSING APPARATUS

DECLARATION UNDER 37 CFR 1.132

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, Xinming Wang, the undersigned and a co-inventor of the invention claimed in the above-referenced US patent application, hereby declares:

That I have a BS degree (1985) and an MS degree (1987) in engineering from Tsinghua University in Peoples Republic of China, and Phd (1994) in engineering from Kyushu Institute of Technology in Japan;

That I have more than 6 years of experience in the field of substrate processing methods, including solutions and liquids used in the substrate processing;

That I am fluent in both the Japanese language and the English language;

That I am familiar with and have carefully reviewed the original disclosure for the above-referenced US patent application;

That the original English translation of the specification includes the following descriptive sections:

"By immersing the substrate in the pretreatment liquid, the substrate is isolated from the external atmosphere while the substrate is being treated, preventing the surface of the activated metal region *from being re-oxidized*" (page 10, lines 25-28 of the original English translation of the specification; emphasis added);

"It is thus possible in the pre-plating treatment [using the pretreatment liquid] to impart a catalyst to the surface of the metal region and simultaneously to *remove an oxide film* on the surface of the metal region" (page 11, lines 14-17 of the original English translation of the specification; emphasis added);

"The pretreatment liquid is prepared by mixing together catalytic metal ions and an acid having a purifying function to remove impurities *including a metal oxide film* on the surface of the metal region" (page 24, lines 24-27 of the original English translation of the specification; emphasis added);

"The pre-plating treatment may be performed by immersing the substrate in the pretreatment liquid, as with the electrolysis plating process. According to such a process, the substrate is isolated from the external atmosphere while the substrate is being treated, *preventing the surface of the activated metal region from being re-oxidized*" (page 42, lines 14-19 of the original English translation of the specification; emphasis added);

That, as an individual who is extensively educated and experienced in the art of substrate processing methods and pretreatment liquids used during substrate processing methods, it is my

general understanding and belief that in order to be capable of removing an existing oxide film from a metal surface of a substrate, and in order to prevent the metal surface from being re-oxidized, a pretreatment liquid must be free of any oxidizing agent;

That, in view of my above-stated general understanding about pretreatment liquids, and in view of the specific teachings in the above-cited sections of the original disclosure in combination with the remaining original disclosure, it is my firm belief and understanding that the above-referenced U.S. patent application at least inherently teaches that the pretreatment liquid of the claimed invention is an aqueous liquid which is free of any oxidizing agent;

That the original English translation of the specification filed on September 3, 2004 includes the following section:

"Specifically, the pretreatment liquid may comprise an aqueous liquid which is a mixture of at least one of *palladium hydrochloric acid*, *palladium sulfuric acid*, and *palladium acetic acid* and at least one of hydrochloric acid, sulfuric acid, fluoric acid, acetic acid, oxalic acid, formic acid, citric acid, and tartaric acid" (page 25, lines 7-12 of the original English translation of the specification; emphasis added);

That the above-quoted section from page 25, lines 7-12 of the original English translation of the Japanese language specification contains a clear and inadvertent translation error which is obvious from a reading of that Japanese language specification which was filed March 19, 2004, and this section of the English language specification should properly read:

"Specifically, the pretreatment liquid may comprise an aqueous liquid which is a mixture of at least one of *palladium chloride*, *palladium sulfate*, and *palladium acetate* and at least one of hydrochloric acid,

sulfuric acid, fluoric acid, acetic acid, oxalic acid, formic acid, citric acid, and tartaric acid" (emphasis added);

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Signed this 15 day of May, 2007

Xinming Wang
Xinming WANG
Inventor



TO
RCE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of : **Confirmation No. 7167**
Xinming WANG et al. : Attorney Docket No. 2004_0441A
Serial No. 10/803,949 : Group Art Unit 1762
Filed March 19, 2004 : Examiner Howard E. Abramowitz
SUBSTRATE PROCESSING METHOD AND : **Mail Stop: RCE**
SUBSTRATE PROCESSING APPARATUS

PATENT OFFICE FEE TRANSMITTAL FORM

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Attached hereto is a check in the amount of \$1690.00 to cover Patent Office fees relating to filing the following attached papers:

Request for Continued Examination (RCE) \$790.00
Petition for Extension of Time \$900.00

A duplicate copy of this paper is being submitted for use in the Accounting Division, Office of Finance.

The Commissioner is authorized to charge any deficiency or to credit any overpayment associated with this communication to Deposit Account No. 23-0975, with the EXCEPTION of deficiencies in fees for multiple dependent claims in new applications.

Respectfully submitted,

Xinming WANG et al.

By

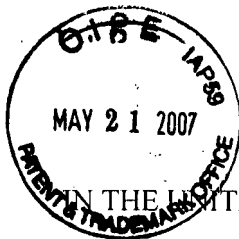
W. Douglas Hahm
Registration No. 44,142
Attorney for Applicants

COMMISSIONER IS AUTHORIZED TO CHARGE ANY DEFICIENCY IN FEE ON THIS PAPER TO DEPOSIT ACCOUNT NO. 23-0975

WDH/akl
WENDEROTH, LIND & PONACK, L.L.P.
2033 K St., N.W., Suite 800
Washington, D.C. 20006-1021
Telephone (202) 721-8200
May 21, 2007

[Check No. 80474]

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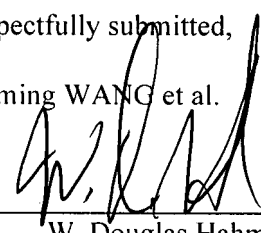
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W. Douglas Hahm
Registration No. 44,142
Attorney for Applicants

WDH/akl
WENDEROTH, LIND & PONACK, L.L.P.
2033 K St., N.W., Suite 800
Washington, D.C. 20006-1021
Telephone (202) 721-8200
May 21, 2007

[Check No. 

2004_0441A